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BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, DC 20268-000

Periodic Reporting
(Proposal Seven)

Docket No. RM2021-1

PUBLIC REPRESENTATIVE COMMENTS ON PROPOSAL SEVEN

(March 5, 2021)

I. EXECUTIVE SUMMARY

The Public Representative commends the Postal Service for the thoughtful and well-explained models and data cleaning procedures it used to estimate the cost-to-capacity ratios for Christmas Routes, DRO Routes, and update remaining Intra-P&DC Routes. He has identified some additional anomalous data points for Intra-SCF Tractor Trailer and Inter-SCF Christmas Routes, which yield slightly higher cost-to-capacity variabilities and higher t-values than those estimated by the Postal Service, albeit with slightly lower adjusted R-squared and F-values. He requests the Commission consider using his cost-to-capacity variability estimates for these two equations because they remove observations where annual miles were less than or equal to zero.

More importantly, the Public Representative opposes the Postal Service's use of the capacity-to-volume variability of 77.3 percent as a proxy value for Christmas Intra-SCF Routes. He opposes the proposed Christmas Intra-SCF capacity-to-volume variability because the Postal Service has convincingly shown that these variabilities are significantly different than those of the Regular Transportation Routes from which the Postal Service draws its proxy of 77.3 percent. He believes it is possible to use the Christmas Route Key Program(s) developed by UPS to estimate a Quarter 1, Christmas Route Key. He proposes a full quarter key, since over 85 percent of Christmas Route Costs were incurred in the first quarter of the TRACS data used by UPS.

He also opposes the Postal Service's use of the capacity-to-volume variability of 77.3 percent as a proxy value for DRO Routes for three reasons: 1) the Postal Service's apparent argument that because DRO contracts had the Regular Transportation Intra-SCF capacity-to-volume variability automatically applied prior to this docket (due to the lack of an estimated capacity-to-cost variability), this state of affairs should continue, is rendered invalid now that an appropriate capacity-to-cost variability has been estimated; 2) the Postal Service has convincingly shown that DRO Contracts differ significantly from Regular Transportation Intra-SCF Contracts; and 3) in its Responses Questions 2 and 5 of CHIR2, the Postal Service has provided preliminary evidence that DRO contracts are more responsive to demand than Regular Intra-SCF Transportation Routes. Because the Commission (in Order 3973, in RM2016-12) rejected using capacity-to-volume variabilities from Regular Transportation Routes as a proxy for route-types which are more responsive to demand than Regular Transportation, and so required using a capacity-to-cost variability of 100 percent until the Postal Service could develop a method to estimate these sorts of contracts using TRACS data, the Commission should follow its precedent in this docket, where the DRO capacity-to-volume variability is likely to be greater than 77.3 percent, and require the Postal Service to apply a proxy of 100 percent capacity-to-volume variability.

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II. INTRODUCTION

On November 9, 2020, the Postal Service filed a petition pursuant to 39 CFR 3050.11, requesting that the Commission initiate a rulemaking proceeding to consider changes to analytical principles relating to periodic reports.[1] The Petition identifies the proposed analytical changes filed in this docket as Proposal Seven. The Petition proposes econometric models to estimate the cost-to-capacity variabilities of Christmas Highway Transportation Routes, Dynamic Route Optimization (DRO) Highway Transportation Routes, and to update the variability estimate for Intra P&DC Highway Transportation Routes.

III. BACKGROUND

A. INTRODUCTION

The established methodology for determining the overall variability of different types of highway transportation (e.g., Inter-SCF, Intra-SCF, Inter-NDC, Intra-NDC) is to multiply the cost-to-capacity variability of each type of transportation by its corresponding capacity-to-volume variability.[2] Doing so yields the cost-to-volume variability, or the percentage change in transportation cost due to a one percent change

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[1] Petition of the United States Postal Service for the Initiation of a Proceeding to Consider Proposed Changes in Analytical Principles (Proposal Seven), November 9, 2020 (Petition). The Postal Service also filed a notice of non-public materials relating to Proposal Seven. Notice of Filing of USPS-RM2021-1-1 and RM2021-1-NP1 and Application for Nonpublic Treatment, November 9, 2020. Finally, the Postal Service filed "Research on Updating Purchased Highway Transportation Variabilities to Account for Structural Changes," by Michael D. Bradley (Bradley Report), November 9, 2020, which explains the rationale for, and procedures used to, estimate variabilities for Christmas and DRO Routes.

[2] *See*, Docket No. ACR2020, USPS Library Reference LR20-36, USPS_FY20_36_TRACS_PREFACE.pdf at 3. Inter-P&DC Routes transport mail between Processing and Distribution Centers; Intra-P&DC Routes transport mail within the area served by a Processing and Distribution Center; Inter-SCF Routes transport mail between Sectional Center Facilities; Intra-SCF Routes transport mail within the area served by a Sectional Center Facility; Inter-NDC Routes transport mail between Network Distribution Centers, and Intra-NDC Routes transport mail within the area served by a Network Distribution Center.

in the volume of mail transported.[3] Equation 1 below expresses this method of calculating overall transportation variability by type of transportation route, where type of highway transportation route is represented by j, and $\% \delta$ means percentage change:

Equation 1

$$\frac{\% \delta \ Cost_j}{\% \delta \ Capacity_j} * \frac{\% \delta \ Capacity_j}{\% \delta \ Volume_j} = \frac{\% \delta \ Capacity_j}{\% \delta \ Volume_j}$$

Because the data source used to estimate the capacity-to-volume variability for each type of transportation, the Transportation Cost System (TRACS), did not provide accurate data on Christmas Routes, the Commission determined that the cost-to-capacity variability of the different types of Christmas Routes was equal to one (or 100 percent).[4]

B. Postal Service's (USPS) Proposals

In this docket, the Postal Service proposes estimating cost-to-capacity variabilities for three types of highway transportation: 1) Christmas Routes, 2) Dynamic Route Optimization Routes (DRO Routes); and 3) Regular Highway Transportation Intra-P&DC Routes, which now exclude DRO Route accounts. The Postal Service reasons that "[t]he introduction of DRO contracts has materially shifted transportation out of the regular Intra P&DC transportation account and into the DRO account." *See*, Bradley Report at 26, 30, 44.

IV. USPS' PROPOSAL TO ESTIMATE VARIABILITIES FOR CHRISTMAS ROUTES

A. Rationale For Estimating Separate Variabilities For Christmas Routes

The Postal Service presents data showing it incurs additional seasonal highway transportation costs for what are known as Christmas contracts. Id. at 2. The Postal

[3] *See*, Docket No. RM2014-12, Order No. 3973 - Order on Analytical Principles Used in Periodic Reporting (Proposal Four) (Order 3973), June 22, 2017 at 4-5.

[4] *See*, Order 3973 at 19.

Service considers Christmas contracts to be seasonal because approximately 85 percent of payments by the Postal Service to compensate Christmas Route contract holders are made in the first quarter of the fiscal year (September 1 to December 31).[5] In addition, the growth in the costs of Christmas contracts has increased from $83 million in Fiscal Year (FY) 2014 to $285.6 million in FY 2019. The Postal Service maintains that these changes warrant investigating whether separate transportation variabilities for Christmas Routes can be estimated. Id. at 3.

B. Model Proposed To Estimate Cost-To-Capacity Variabilities For Christmas Routes

The Postal Service proposes to estimate the cost-to-capacity variabilities for Christmas Routes (Inter-SCF, Intra-SCF, Inter-NDC, Intra-NDC, etc.) using the model accepted for corresponding route-types adopted in RM2014-6.[6] This accepted model uses data from the FY 2013 Transportation Contract Support System (TCSS), to regress the natural log of the mean-centered annual cost, against the natural log of mean-centered cubic foot miles, route length, cross term variables, such as *RouteLength x Cubic FootMiles*, and geographic dummy variables that are not mean-centered for different contract/route types (e.g. *IntraSCFContracts x TruckRoute*). The Christmas Regressions are expressed mathematically in Equation 2 below. CFM stands for cubic foot-miles, RL stands for route length, j is an index for individual contract cost segments, the "bar" notation indicates a mean value, D_i are categorical

[5] The actual percent of the costs incurred by holders of Christmas Route contracts in the first quarter of the Fiscal Year (Q1) should be higher than the 85.4 percent the Postal Service paid out in Q1. The Postal Service explains that 9.2 percent of the compensation it pays to holders of Christmas Route contracts are made in Q2. Some portion of this 9.2 percent payment represents costs incurred in Q1, because the Postal Service allows holders of Christmas Route contracts 90 days in which they may submit requests for late and extra trip costs [incurred] … during the Peak Season." *See*, Responses of The United States Postal Service to Questions 1-9 of Chairman's Information Request No. 1, Response to Question 2.b., January 7, 2021.

[6] *See*, Docket No. RM2014-6, Order on Analytical Principles Used in Periodic Reporting (Proposals Three through Eight), Order No. 2180, September 10, 2014 at 16.

variables representing Postal Service areas, ε is the error term, and β and δ coefficients represent the parameters which will be estimated.

Equation 2

$$lnCost_j = \beta_0 + \sum_{i=1}^{n} \delta_i D_i + \beta_1 ln\left(\frac{CFM_j}{\overline{CFM}}\right) + \beta_2 ln\left(\frac{CFM_j}{\overline{CFM}}\right)^2 + \beta_3 ln\left(\frac{RL_j}{\overline{RL}}\right) + \beta_4 ln\left(\frac{RL_j}{\overline{RL}}\right)^2 + \beta_5 ln\left(\frac{CFM_j}{\overline{CFM}}\right) \cdot ln\left(\frac{RL_j}{\overline{RL}}\right) + \varepsilon_j$$

To determine whether it would be appropriate to apply the accepted model to Christmas Routes, the Postal Service first seeks to determine whether Christmas Routes have similar operational and cost causing characteristics as Regular Highway Transportation Routes. USPS first explains that data for both Christmas and Regular Highway Transportation Routes are available for each contract cost segment. This allows the regression to distinguish among different route characteristics, such as type of truck. Id at 5. The Postal Service also explains that Christmas and Regular transportation contracts use similar operations, scheduling, and compensation methods. Id. at 9. Finally, the Postal Service compares various operating characteristics of Regular and Christmas Transportation Routes, such as median truck capacity, median trip length, median annual cost) and they are generally comparable, or have understandable differences.[7]

Having determined that Christmas and Regular Transportation Routes have similar operating and cost characteristics, the Postal Service proposes using the model accepted to estimate the cost-to-capacity variabilities of different types of Regular Transportation Routes to estimate the cost-to-capacity variabilities of different types of Christmas Routes. Id. at 11. The Postal Service uses the following procedure to

[7] *See*, Bradley Report at 11; and Responses of The United States Postal Service to Questions 1-7 of Chairman's Information Request No. 2, Response to Question 1, February 27, 2021.

estimate the cost-to-capacity variabilities of various types of Christmas Transportation Routes:

- aggregate TCSS data to the cost segment level
- determine truck types (e.g., van or tractor trailer)
- define account categories (e.g., Intra-SCF Christmas, Intra-SCF Regular, DRO)
- select Christmas Accounts
- mean center the natural logarithm of dependent and independent variables
- estimate the variabilities after correcting for heteroscedasticity
- identify potentially anomalous observations
- re-estimate the variability equations with anomalous observations removed[8]

C. Multiply Cost-to-Capacity Variabilities By Appropriate Capacity-To-Volume Variabilities.

Equation 1, above, shows that the current method of determining the percentage change in transportation cost in response to a 1 percent change in transportation volume is the product of the cost-to-capacity variability of the type of route (e.g., Christmas, Intra-SCF) and its corresponding capacity-to-volume variability, estimated in RM2016-12 (Order No. 3971).[9] Table 1 below, shows the proposed cost-to-capacity route-type variabilities of Christmas Routes (aggregated to a level which matches the proposed capacity-to-volume variabilities, and the proposed cost-to-volume variabilities of Christmas Routes.

[8] *See*, Responses of The United States Postal Service to Questions 1-9 of Chairman's Information Request No. 1, Response to Question 3, January 7, 2021

[9] See, Docket No. RM2016-12, Order On Analytical Principles Used In Periodic Reporting, (Proposal Four), Order No. 3971, August 22, 2016 (Order No. 3971), June 22, 2017.

Table 1
Variabilities for Christmas Transportation

	Variabilities		
Transportation Group	Cost-to-Capacity	Capacity-to Volume	Cost-to-Volume
	A	B	C = A x B
Christmas Intra-SCF	96.3%	100.0%	96.3%
Christmas Inter-SCF	95.3%	100.0%	95.3%
Christmas NDC	95.2%	100.0%	95.2%

Source: Bradley Report, Table 12 at 28.

The product of the cost-to-capacity and the capacity-to-volume variabilities provides the required cost-to-volume variabilities. Christmas Route's Capacity-to Volume Variabilities are 100 percent because the Commission determined that for "accounts associated with [Christmas] routes, the Postal Service shall continue to apply the current [100 percent] assumption regarding proportionality between capacity and volume." Order No. 3971 at 19.

V. USPS' PROPOSAL TO ESTIMATE VARIABILITIES FOR DRO ROUTES

A. Rationale For Estimating Separate Variabilities For DRO Routes

DRO Routes are a new type of highway contract route, which, at the moment, have been replacing Regular Intra-P&DC Highway Contract Routes. The Postal Service explains that in contrast to Regular Highway Contract Routes, DRO Route contracts do not have fixed routes, but can change weekly. The Bradley Report explains that "DRO contracts do not have fixed annual contract awards, but rather are paid on a per-mile rate." Bradley Report at 29. DRO Routes were implemented in order to minimize miles travelled per week, given a magnitude of number of constraints operating at the time weekly DRO route assignments are made, such as departure time, arrival time, window of operations, and dock availability.[10]

[10] *See*, Responses of The United States Postal Service Questions 1-7 of Chairman's Information Request No. 2, Responses to Questions 2 and 5, January 7, 2021.

Because the operational features of DRO Routes clearly differ from the Regular Intra-P&DC Routes they have been replacing, they are likely to respond differently to capacity changes than Regular Intra-P&DC Transportation Routes. This which means that DRO Routes are likely to have different variabilities than the Intra-P&DC routes they are replacing. Consequently, it would be inappropriate to use the capacity-to-cost variabilities for DRO Routes as a proxy for Intra-P&DC Routes' capacity-to-cost variabilities. Bradley Report at 30, 33.

B. Model Proposed To Estimate Cost-To-Capacity Variabilities For DRO Routes

The primary difference between Intra-P&DC routes and DRO routes for estimation purposes, is that the compensation paid for DRO contracts does not vary with route length. Consequently, route length in not a relevant explanatory variable for the model used to estimate cost-to-capacity variability. Id. at 33. For this reason, the proposed model is the same as the one expressed in Equation 2, except there are no variables which measure route length. All other steps taken to estimate the DRO model are the same as those taken for Christmas Routes. However, the Postal Service determined that model results for DRO Tractor Trailer and Van Routes would be improved by estimating an equation which combined both types of trucks and included a dummy variable for small truck capacity (which would represent van routes). Id. at 41.

C. Multiply Cost-to-Capacity Variabilities By Appropriate Capacity-To-Volume Variabilities

Equation 1, above, shows that the current method of determining the percentage change in transportation cost in response to a 1 percent change in transportation volume is the product of the cost-to-capacity variability of the type of route (in this case Aggregate DRO variability) and its corresponding capacity-to-volume variability. Since TRACS data for DRO routes did not exist in FY 2016, when were last used to estimate capacity-to-volume estimates, an accepted capacity-to-volume variability for DRO Routes does not exist. The Postal Service argues that the capacity-to-volume variability

of Intra-SCF Regular Highway Transportation Routes (77.3 percent), can serve as a reasonable proxy. It argues that, it has been multiplying the Intra-SCF capacity-to-cost variability by the Intra-P&DC capacity-to-cost variability, to determine overall Intra-P&DC variability, while DRO Route Contracts were increasing, but not formally recognized for capacity-to-cost purposes, within Intra-P&DC contracts. *See*, Bradley Report at 42, fn. 25.

Table 2
Variabilities for DRO Routes

	Variabilities		
Transportation Group	Cost-to-Capacity	Capacity-to Volume	Cost-to-Volume
	A	B	C = A x B
Intra SCF (DRO) Routes	100.0%	77.3%	77.3%

Source: Bradley Report, Table 12 at 28.

VI. USPS' PROPOSAL TO UPDATE VARIABILITIES FOR INTRA-P&DC VARIABILITY CONTRACTS

A. Rationale For Updating Variabilities For Intra-P&DC Routes

The Postal Service explains that there has been a substantial shift in costs from Intra-P&DC contracts to DRO contracts between FY 2014 and FY 2019. Id. at 43. This shift warrants updating Intra-P&DC variabilities now that they no longer include the routes which have become DRO Routes. While this appears reasonable, it is worth noting at this point that the Postal Service does not show how this shift to DRO Routes has altered the cost structure of Intra-P&DC Routes.

B. Models Proposed To Estimate Cost-To-Capacity Variabilities For Intra P&DC Routes

The Postal Service explains that it is appropriate to use the same models and corrective procedures to estimate Intra-P&DC City, Van, and Tractor Trailer capacity-to-cost variabilities first used in RM2014-6,[11] since it is updating these variabilities in order

[11] See, Docket No. RM2014-6, Order on Analytical Principles Used in Periodic Reporting (Proposals Three through Eight), USPS-RM2014-6/1 - Public Material Relating to Proposal Six, Report on

to test whether or not removing DRO routes has altered the cost-to-capacity variabilities, all things remaining the same.[12] Id. at 45. As is the case with proposed cost-to-capacity models, the model includes independent variables which measure the mean-centered, natural log of Route Length, its square, and a route length term "crossed" with the mean-centered, natural log of cubic foot miles.

One difference between the proposed updated models and those presented for Intra-P&DC Routes in the RM2014-6 Report, is the absence of Intra-P&DC Box Routes. The Postal Service argues that it is not necessary to update cost-to-capacity variabilities of Intra-P&DC Box Routes because these contracts were not affected by the introduction of DRO contracts. Id. at 44, fn. 26.

C. Multiply Cost-to-Capacity Variabilities By Appropriate Capacity-To-Volume Variabilities.

The proposed cost-to-capacity variabilities, along with the accepted Box Route cost-to-capacity variability, their respective cost shares, and weighted average variability are presented in Table 3 below.

Updating the Cost-to-Capacity Variabilities for Purchased Highway Transportation (RM2014-6 Report), June 20, 2014.

[12] Presumably, a significant change in one of the three variabilities, would suggest further investigation to determine whether the altered variabilities were the result of removing DRO routes, altered supply and demand conditions independent of the removal of DRO routes, or a combination of the two.

Table 3
Variabilities for Updated Intra-P&DC Routes

Route Type	Cost-to-Capacity Variability	Cost Share	Weighted Cost-to-Capacity Variability
	A	B	C = A x B
City	69.3%	8.84%	6.1%
Van	78.1%	51.79%	40.4%
Tractor Trailer	91.5%	37.81%	34.6%
Box	24.2%	1.57%	0.4%
Weighted Average			**81.6%**

Source: Bradley Report, Table 28 at 52.

By including the accepted Box Route cost-to-capacity variability of 24.2%, the proposed updated cost-to-capacity variability of Intra-P&DC Routes is 81.6%. Applying the accepted Intra-P&DC capacity-to-volume variability of 77.3%,[13] yields an overall updated variability for Intra-P&DC Routes equal to 63.0% (rounded to a single decimal place).[14] Id. at 52.

VII. PUBLIC REPRESENTATIVE COMMENTS AND RECOMMENDATIONS

A. Christmas Routes

1. Additional Anomalous Observations Should Be Removed

After reviewing the Bradley Report, and the Postal Service's Responses to CHIR1 through CHIR4, the Public Representative believes the proposed cost-to-capacity variabilities have been estimated using an appropriate model, and with two possible exceptions, used appropriate techniques to identify, and justify removing anomalous outliers for Christmas Routes. The Public Representative supports the proposed cost-to-capacity variabilities, but suggests it would be appropriate to remove observations where annual miles are less than or equal to one. There were 9 such

[13] It is the same as the accepted capacity-to-volume variability of Intra-SCF Routes. *See*, Order No. 3971, at 38.

[14] Rounding to two decimal places, yields the cost-to-volume variability of 63.02 found in USPS-RM2021-1-NP1 - Nonpublic Material Relating to Proposal Seven, File: CS14-NP-FY19.New Variabilities.xlsx, Sheet: Inputs – Variabilities.

observations in the Inter-SCF equation; and 5 in the Intra-SCF Tractor Trailer equation. All other Christmas Route estimates did not have annual miles less than or equal to one. Table 4 below, compares the estimated variabilities for the two equations where annual miles less than or equal to one existed and were deleted.

Table 4
Christmas Route Variability Comparison After Removing Observations With Miles ≤ 1

Route Type	Proposed Variability	Variability With Miles ≤ 1 Removed
Inter-SCF	95.3%	96.3%
Intra-SCF Tractor Trailer	96.4%	100.0%

Sources: USPS-RM2014-6/1 - Public Material Relating to Proposal Six, xmas inter scf variability equations.lst; Attachment 1: PR Sas Program For Xmas Intra-SCF Variability, PR Sas Output for Xmas Intra-SCF Variability; and Attachment 2: PR Sas Program For Xmas Intra SCF Variability, PR Sas Output For Xmas Intra-SCF Variability.

Because the capacity-to-volume variabilities are 100 percent, the cost-to-volume variabilities for Inter-SCF, and Intra-SCF Tractor Trailer Routes are 96.3 and 100.0 percent, respectively.

2. Appropriate Distribution Keys Should Be Developed

UPS notes in its Comments that "[u]nder the Postal Service petition, the distribution keys applied to Christmas and DRO routes remain the set of distribution keys derived from regular highway transportation accounts."[15] UPS goes on to estimate one set of Christmas Distribution Keys for October and November, and another set for December. The Public Representative agrees that it is possible and necessary to develop distribution keys from TRACS data for Christmas Routes. He believes these keys would ideally be developed from all quarters in FY 2019, since Christmas Route

[15] Initial Comments of United Parcel Service, Inc. on Notice of Proposed Rulemaking on Analytical Principles Used in Periodic Reporting (Proposal Seven), February 26, 2021, at

volumes appear to be incurred in each of the four quarters of FY 2019.[16] However, since at least 85% of Christmas Contract costs were incurred in Quarter 1, a Christmas Route distribution key developed from this Quarter would provide a much more accurate distribution of attributable costs to products than the Regular Highway Route distribution key.

B. DRO Routes

1. Additional Anomalous Observations Are Not Present

After reviewing the Bradley Report, and the Postal Service's Responses to CHIR1 through CHIR4, the Public Representative believes the proposed cost-to-capacity variabilities have been estimated using an appropriate model and used appropriate techniques to identify, and justify, removing anomalous outliers for DRO Routes. The Public Representative did not find any models where annual miles were ≤ 1. He recommends the Commission accept the Postal Service's estimate of DRO capacity-to-cost variability of 100 percent. Id. at 41.

2. DRO Capacity-To-Volume Variability Should Be 100 Percent

The Postal Service proposes to use the capacity-to-volume variability of Regular Intra-SCF Transportation, which is equal to 77.3 percent, as a proxy for a DRO a capacity-to volume variability estimate. Id. 42. The Bradley Report justifies using 77.3 percent as a proxy, because "volumes and capacities for the type of transportation DRO contracts provide were included in the estimation of the Intra-SCF capacity-to-cost variability." Id. at 41, fn. 25.

The Postal Service appears to be arguing that because DRO contracts had the Regular Transportation Intra-SCF capacity-to-volume variability automatically applied prior to this docket because they were not considered to be different from Regular

[16] Fn. 5 in these Comments maintains that some portion of the Christmas Route payments made in quarters 2, 3, and 4 were incurred in prior quarters. Nevertheless, it is likely that some Christmas route volumes were incurred in all four quarters of FY 2019.

Transportation Routes, this practice should continue even after the Postal Service has shown in this proceeding that DRO capacity-to-cost variabilities are substantially different than Regular Transportation Routes.

The Postal Service confirms that TRACS data do not currently permit it to estimate a capacity-to-volume variability for DRO Routes. Id. at 41, fn. 25. Consequently, until the Postal Service is able to use TRACS to estimate a capacity-to-volume variability for DRO Routes, the Commission should apply a 100 percent capacity-to-volume variability, as it did in RM2016-12, and reject the inappropriate proxy of 77.3%.

C. Updating Intra P&DC Routes

1. Additional Anomalous Observations Are Not Present

After reviewing the Bradley Report, and the Postal Service's Responses to CHIR1 through CHIR4, the Public Representative believes the proposed cost-to-capacity variabilities have been estimated using an appropriate model, used appropriate techniques to identify, and justify removing anomalous outliers for remaining Intra-P&DC routes.[17] He recommends the Commission accept the proposed capacity-to-cost variability estimates of Intra-P&DC, City, Van, and Tractor Trailer Routes. Id. at 51.

2. Capacity-To-Volume Variability Should Be 77.3 Percent

The Public Representative agrees with the Postal Service that since the capacity-to-volume variability for Intra-P&DC routes has been estimated and accepted by the Commission in RM2016-12, 77.3 percent should remain the capacity-to-volume variability applied to the estimated Intra-P&DC capacity-to-cost variability of 81.6 percent. *See*, Table 3, above.

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[17] The Public Representative did not find any models where annual miles were ≤ 1.

VIII. Conclusion

The Public Representative respectfully submits the foregoing comments for the Commission's consideration.

Respectfully Submitted,

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IX. ATTACHMENT 1

A. PR Sas Program For Xmas Intra-SCF Variability

```
*PR Test for annual miles le 1;

*****************************************************************************;
***  This Program Estimates the Cost to Capacity Variabilites              ***;
***  For Intra SCF Seasonal Transportation Designated as Christmas Contracts***;
*****************************************************************************;

libname T19 "path" ;
options nodate ;
ods graphics off;

data TCSS2; set t19.TCSS_FY19;

*********************************************;
*Read in the Data and Determine Area Dummy  **;
*********************************************;
Data Tcss3; set tcss2;
annual_cost = costsegamt;
annual_miles = annmiles;
if annmiles=0 then annual_miles=".";
A1 = 0; if area = "CARIBBE" then A1=1;
A2 = 0; if area = "CENTRAL" then A2=1;
A3 = 0; if area = "EASTERN" then A3=1;
A4 = 0; if area = "NORTHER" then A4=1;
A5 = 0; if area = "SOUTHER" then A5=1;
A6 = 0; if area = "WESTERN" then A6=1;
tcfm=tripmiles*opfreq*vcube;


*************************************************;
***Aggregate to the Cost Segment Level   ***;
*************************************************;
proc sort data=tcss3; by route costsegmentcode;

proc means noprint data=tcss3; by route costsegmentcode; id con_type routetypedesc
area account  con_desc a1 a2 a3 a4 a5 a6;
var annual_cost annual_miles opfreq vcube tripmiles tcfm ;
output out=costsegment_lev mean=annual_cost annual_miles aopfreq  vcube atripmiles
atcfm
```

```
                    sum=sannual_cost sannual_miles sopfreq  svcube stripmiles  cfm
                      n=ntrips;

**************************************************;
**Determine Truck Type                          **;
**************************************************;
data costsegment_lev; set costsegment_lev;
truck_type = "None";
if vcube lt 1800 then truck_type = "Van" ;
else truck_type = "TT";
if annual_miles eq '.' then delete;
calc_cost_cfm=annual_cost/cfm;


**********************************************;
***       Define Account Categories     ***;
**********************************************;

DATA COSTSEGMENT_LEV; SET COSTSEGMENT_LEV;
length account_desc $ 15;
account_desc = "OTHER";
if account = 53605 or account = 53607 then account_desc =  "INTRA_DISTRICT";
if account = 53601 or account = 53603 then account_desc =  "INTRA_PDC";
if account = 53609 or account = 53612 then account_desc =  "INTER_PDC";
if account = 53614 or account = 53616 then account_desc =  "INTER_CLUSTER";
if account = 53618 or account = 53621 then account_desc =  "INTER_AREA";
if account = 53127 or account = 53129 then account_desc =  "INTRA_NDC";
if account = 53131 or account = 53133 then account_desc =  "INTER_NDC";
if account = 53134 or account = 53135 then account_desc = "PLANT LOAD";
if account = 53622 then account_desc = "XINTER_AREA";
if account = 53626 then account_desc = "XINTER_AREAHQ";
if account = 53617 then account_desc = "XINTER_CLUSTER";
if account = 53613 then account_desc = "XINTER_PDC";
if account = 53624 then account_desc = "XINTER_NDC";
if account = 53625 then account_desc = "XINTRA_AREAHQ";
if account = 53608 then account_desc = "XINTRA_DISTRICT";
if account = 53604 then account_desc = "XINTRA_PDC";
if account = 53623 then account_desc = "XINTRA_NDC";
if account = 53170 then account_desc = "DRO";
```

```
*********************************************************************;
*****  Estimate XMAS Intra SCF Variabilities *********************;
*********************************************************************;
data XTRA_SCF; set costsegment_lev;

if account_desc = "XINTRA_AREAHQ" or account_desc = "XINTRA_DISTRICT"  or
account_desc = "XINTRA_PDC"  ;
proc freq; tables truck_type account_desc area ;

*****************************************************;
*****  Estimate Van Variability Equation    ******;
*****************************************************;
data XTRA_SCF_Van; set XTRA_SCF;
if truck_type="Van";

proc freq; tables area;

*********************************************************************;
*****  Find Global Means                ****************************;
*********************************************************************;
proc means median;
var annual_cost annual_miles cfm atripmiles vcube aopfreq;
output out=gmean mean=g_annual_cost g_annual_miles g_cfm g_stripmiles g_vcube
g_aopfreq n=obs;


*********************************************************************;
*****  Mean Center the Data             ****************************;
*********************************************************************;

data XTRA_SCF_Van_Reg;
if _n_=1 then set gmean; set XTRA_SCF_Van;

lnCost=log(annual_cost);
lnCFM=log(cfm/g_cfm);
lnRL=log(atripmiles/g_stripmiles);
lnCFM2=lnCFM*lnCFM;
lnRL2=lnRL*lnRL;
lnCFMlnRL=lnCFM*lnRL;
```

```
*********************************************************************;
*****  Estimate the Equation            ******************************;
*********************************************************************;
title "XTRA_SCF VAN";

Proc reg data=XTRA_SCF_Van_reg   ;
model lnCost =  a3 a4 a5 a6 lnCFM lnCFM2 lnRL lnRL2 lnCFMlnRL / white ;
output out=XTRA_SCF_VAN_resid rstudent=rstd h=levr cookd=ckd ;

data XTRA_SCF_Van_cooksd; set XTRA_SCF_VAN_resid;
   costcfm=annual_cost/cfm;
         if ckd > (4/obs);
         proc sort data=XTRA_SCF_Van_cooksd; by ckd;

         proc print data=XTRA_SCF_Van_cooksd;
         var route costsegmentcode ckd rstd levr annual_cost annual_miles cfm
atripmiles costcfm aopfreq;

data XTRA_SCF_VAN_cooksd; set XTRA_SCF_VAN_cooksd;
keep route costsegmentcode ckd;
run;

*********************************************************************;
*****  Estimate TT Equation             ******************************;
*********************************************************************;

data XTRA_SCF_TT; set XTRA_SCF;
if truck_type="TT";

proc freq; tables area;

*****************************************************;
*****  Find Global Means                **************;
*****************************************************;
proc means median;
var annual_cost annual_miles cfm atripmiles vcube aopfreq;
output out=gmean mean=g_annual_cost g_annual_miles g_cfm g_stripmiles g_vcube
g_aopfreq n=obs;
```

```
*********************************************************************;
*****  Mean Center the Data            ******************************;
*********************************************************************;
data XTRA_SCF_TT_Reg;
if _n_=1 then set gmean; set XTRA_SCF_TT;

lnCost=log(annual_cost);
lnCFM=log(cfm/g_cfm);
lnRL=log(atripmiles/g_stripmiles);
lnCFM2=lnCFM*lnCFM;
lnRL2=lnRL*lnRL;
lnCFMlnRL=lnCFM*lnRL;

*********************************************************************;
*****  Estimate the Equation           ******************************;
*********************************************************************;
title "XTRA_SCF TT";
proc reg data=XTRA_SCF_TT_reg  ;
model lnCost =  a3 a4 a5 a6   lnCFM lnCFM2 lnRL lnRL2 lnCFMlnRL / white ;
output out=XTRA_SCF_TT_resid rstudent=rstd h=levr cookd=ckd ;


Data XTRA_SCF_TT_cooksd; set XTRA_SCF_TT_resid;
   costcfm=annual_cost/cfm;
    if ckd > (4/obs);
   proc sort data=XTRA_SCF_TT_cooksd; by ckd;

proc print data=XTRA_SCF_TT_cooksd;
var route costsegmentcode ckd rstd levr annual_cost annual_miles cfm atripmiles
costcfm aopfreq;

data XTRA_SCF_TT_cooksd; set XTRA_SCF_TT_cooksd;
keep route costsegmentcode ckd;
run;
```

```
*****************************************************************************;
*** Estimate Models with Outliers Removed   Including Miles LE 1    ****;
*****************************************************************************;

*******************************************************************;
*****  Estimate Van Equation            ****************************;
*******************************************************************;


data XTRA_SCF_Van1; set XTRA_SCF;
if truck_type="Van";

proc sort  data=XTRA_SCF_Van1; by route costsegmentcode;
proc sort  data= XTRA_SCF_Van_cooksd; by route costsegmentcode;

data XTRA_SCF_Van2; merge  XTRA_SCF_Van1 XTRA_SCF_Van_cooksd; by route
costsegmentcode;

data XTRA_SCF_Van2;  set XTRA_SCF_Van2;
if ckd ge .10 then delete;

data test; set XTRA_SCF_Van2; *Miles LE 1;
where annual_miles le 1;
proc print;
var route annual_miles annual_cost;
run;

data XTRA_SCF_Van2; set XTRA_SCF_Van2;
if annual_miles le 1 then delete;  *Delete Miles Le 1;
proc means median;
var annual_cost annual_miles cfm atripmiles ;
output out=gmean mean=g_annual_cost g_annual_miles g_cfm g_stripmiles ;

data XTRA_SCF_Van2_Reg;
if _n_=1 then set gmean; set XTRA_SCF_Van2;

lnCost=log(annual_cost);
lnCFM=log(cfm/g_cfm);
lnRL=log(atripmiles/g_stripmiles);
lnCFM2=lnCFM*lnCFM;
lnRL2=lnRL*lnRL;
lnCFMlnRL=lnCFM*lnRL;
```

```
Proc reg data=XTRA_SCF_Van2_reg outest=xvanparm; ;
title "XTRA_SCF VAN WITHOUT OUTLIERS";
model lnCost = a3 a4  a6   lnCFM lnCFM2 lnRL lnRL2 lnCFMlnRL / white ;

data vanvar; set xvanparm;
var=lncfm;
contype = 'VANR';
keep var contype;


*********************************************************************;
*****  Estimate TT Equation            ****************************;
*********************************************************************;

data XTRA_SCF_TT1; set XTRA_SCF;
if truck_type="TT";

proc sort  data= XTRA_SCF_TT1; by route costsegmentcode;
proc sort  data= XTRA_SCF_TT_cooksd; by route costsegmentcode;

data XTRA_SCF_TT2; merge  XTRA_SCF_TT1 XTRA_SCF_TT_cooksd; by route
costsegmentcode;

data XTRA_SCF_TT2;  set XTRA_SCF_TT2;
if ckd ge .10 then delete;

data test2; set XTRA_SCF_TT2; *Test Miles LE 1;
where annual_miles le 1;
proc print;
var route annual_miles annual_cost;
run;

data XTRA_SCF_TT2;  set XTRA_SCF_TT2;
if annual_miles le 1 then delete;  *Delete Miles LE 1;

proc means median;
var annual_cost annual_miles cfm atripmiles;
output out=gmean mean=g_annual_cost g_annual_miles g_cfm g_stripmiles;
```

```
data XTRA_SCF_TT2_Reg;
if _n_=1 then set gmean; set XTRA_SCF_TT2;

lnCost=log(annual_cost);
lnCFM=log(cfm/g_cfm);
lnRL=log(atripmiles/g_stripmiles);
lnCFM2=lnCFM*lnCFM;
lnRL2=lnRL*lnRL;
lnCFMlnRL=lnCFM*lnRL;


title "XTRA_SCF TT WITHOUT OUTLIERS";
Proc reg data=XTRA_SCF_TT2_reg  outest=xttparm ;;
model lnCost =      a4 a5 a6 lnCFM lnCFM2 lnRL lnRL2 lnCFMlnRL / white ;

data ttvar; set xttparm;
var=lncfm;
contype = 'TTR' ;
keep var contype;


*******************************************************************************;
**** Calculate The Intra SCF Variablity   ******************************************;
*******************************************************************************;

data vvars; set vanvar ttvar;
proc sort; by contype;


data cxntra_scf; set costsegment_lev;
contype="None";

if account_desc = "XINTRA_AREAHQ" or account_desc = "XINTRA_DISTRICT"  or
account_desc = "XINTRA_PDC"  ;

if truck_type='Van' then contype='VANR';;
if truck_type='TT' then contype='TTR';

proc sort data=cxntra_scf; by contype;

*******************************************************************************;
**** Sum Costs By Transporation Type  ***********************************************;
*******************************************************************************;
```

```
proc means  noprint; by contype;
var annual_cost;
output out=tcosts sum=s_annual_cost;
proc sort data=tcosts; by contype;

data calvar; merge tcosts vvars; by contype;

*******************************************************************************;
**** Calculate The Variability       ***********************************************;
*******************************************************************************;
data calvar; set calvar;

VVC = var*s_annual_cost;

proc print;


proc means noprint;
var s_annual_cost VVC;
output out=Calcvv sum = accrued volvar;

data calcvv; set calcvv;
overall_vv = volvar/accrued;

proc print;


run;
quit;
```

B. PR Sas Output For Xmas Intra-SCF Variability

PR SAS Output for Intra SCF Variability

The SAS System 1

The FREQ Procedure

truck_ type	Frequency	Percent	Cumulative Frequency	Cumulative Percent
TT	504	54.55	504	54.55
Van	420	45.45	924	100.00

account_desc	Frequency	Percent	Cumulative Frequency	Cumulative Percent
XINTRA_AREAHQ	817	88.42	817	88.42
XINTRA_DISTRICT	1	0.11	818	88.53
XINTRA_PDC	106	11.47	924	100.00

area	Frequency	Percent	Cumulative Frequency	Cumulative Percent
CENTRAL	324	35.06	324	35.06
EASTERN	88	9.52	412	44.59
NORTHER	95	10.28	507	54.87
SOUTHER	139	15.04	646	69.91
WESTERN	278	30.09	924	100.00

The SAS System

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                              2

                                The FREQ Procedure

                                                  Cumulative    Cumulative
               area       Frequency     Percent     Frequency      Percent
               ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
               CENTRAL         160       38.10           160        38.10
               EASTERN          45       10.71           205        48.81
               NORTHER          34        8.10           239        56.90
               SOUTHER          50       11.90           289        68.81
               WESTERN         131       31.19           420       100.00
                                 The SAS System                                            3

                               The MEANS Procedure

                               Variable              Median
                               ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
                               annual_cost          4214.15
                               annual_miles         1616.00
                               cfm               1904080.00
                               atripmiles        48.6500000
                               vcube                1200.00
                               aopfreq           15.0000000
                               ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
```

XTRA_SCF VAN 4

The REG Procedure

Model: MODEL1

Dependent Variable: lnCost

Number of Observations Read 420

Number of Observations Used 420

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	668.61939	74.29104	439.73	<.0001
Error	410	69.26846	0.16895		
Corrected Total	419	737.88785			

Root MSE	0.41103	R-Square	0.9061
Dependent Mean	8.32069	Adj R-Sq	0.9041
Coeff Var	4.93988		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	--Heteroscedasticity Consistent- Standard Error	t Value	Pr > |t|
Intercept	1	9.05497	0.03948	229.37	<.0001	0.03809	237.75	<.0001
A3	1	0.21052	0.07052	2.99	0.0030	0.07375	2.85	0.0045
A4	1	0.39564	0.08488	4.66	<.0001	0.08847	4.47	<.0001
A5	1	-0.00367	0.06764	-0.05	0.9568	0.05700	-0.06	0.9487
A6	1	0.13798	0.04985	2.77	0.0059	0.04742	2.91	0.0038
lnCFM	1	0.93495	0.02203	42.43	<.0001	0.03187	29.34	<.0001
lnCFM2	1	0.00151	0.00789	0.19	0.8480	0.01406	0.11	0.9144
lnRL	1	-0.22934	0.04190	-5.47	<.0001	0.03627	-6.32	<.0001
lnRL2	1	0.03013	0.02459	1.23	0.2211	0.03206	0.94	0.3479
lnCFMlnRL	1	-0.03166	0.01935	-1.64	0.1026	0.02733	-1.16	0.2474

XTRA_SCF VAN 5

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Obs	route	gmentcode	ckd	rstd	levr	nual_cost	ual_miles	cfm	tripmiles	costcfm	aopfreq
1	496L1	C	0.00984	1.02354	0.08591	3596.45	450.0	540000.00	3.5167	0.006660	12.333
2	23035	C	0.01020	-1.27880	0.05878	1097.29	319.0	382800.00	5.5000	0.002866	29.000
3	070AA	B	0.01129	1.70469	0.03756	84150.34	9541.8	11450160.00	19.6333	0.007349	27.000
4	35630	B	0.01147	-2.12543	0.02497	562.96	507.6	609120.00	63.4500	0.000924	4.000
5	700DG	B	0.01176	1.71775	0.03850	84779.49	19092.3	22910760.00	46.1167	0.003700	23.000
6	700EG	B	0.01179	1.67083	0.04070	80947.04	20820.8	26234208.00	80.0800	0.003086	26.000
7	98032	D	0.01223	2.07202	0.02792	968.34	100.8	120960.00	16.8000	0.008005	3.000
8	328M6	D	0.01314	-1.64820	0.04633	149.29	82.2	98640.00	20.5500	0.001513	2.000
9	018L0	D	0.01375	1.95600	0.03493	11221.76	1136.2	1363440.00	24.7000	0.008230	23.000
10	727CA	A	0.01474	-0.61681	0.27896	124171.23	32343.0	40752532.80	6.2500	0.003047	254.892
11	018L0	C	0.01723	2.04230	0.03997	12291.53	952.2	1142640.00	10.3500	0.010757	23.000
12	28231	E	0.01839	2.26104	0.03506	2304.44	276.8	332160.00	69.2000	0.006938	4.000
13	58431	B	0.01949	2.10086	0.04262	968.74	514.2	154260.00	85.7000	0.006280	3.000
14	023N0	A	0.02240	-1.22370	0.13028	159330.89	53715.4	70897416.45	18.7333	0.002247	243.957
15	28060	B	0.02945	3.43509	0.02497	9501.28	2544.0	763200.00	26.5000	0.012449	24.000
16	580A4	B	0.03332	2.76852	0.04230	1177.26	472.8	141840.00	78.8000	0.008300	3.000
17	28030	C	0.03488	3.57451	0.02731	5755.56	402.8	483360.00	50.3500	0.011907	4.000
18	92337	B	0.29653	-7.45982	0.05695	21.31	48.8	80520.00	6.1000	0.000265	4.000
19	570BA	E	0.30041	2.61999	0.30743	30320.34	1482.0	1778400.00	1.6583	0.017049	25.000
20	023N0	B	0.34252	-7.36263	0.06663	8620.90	36701.8	44042132.40	30.2750	0.000196	303.070
21	83366	B	0.41511	3.56017	0.25196	125.95	72.0	8640.00	9.0000	0.014578	4.000

The FREQ Procedure

area	Frequency	Percent	Cumulative Frequency	Cumulative Percent
CENTRAL	164	32.54	164	32.54
EASTERN	43	8.53	207	41.07
NORTHER	61	12.10	268	53.17
SOUTHER	89	17.66	357	70.83
WESTERN	147	29.17	504	100.00

```
The MEANS Procedure

Variable              Median
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
annual_cost         16458.73
annual_miles         4515.00
cfm              12968432.00
atripmiles        75.7500000
vcube                3180.00
aopfreq           20.2000000
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
```

```
                                        XTRA_SCF TT                                                  8
                                     The REG Procedure
                                       Model: MODEL1
                                 Dependent Variable: lnCost

                          Number of Observations Read         504
                          Number of Observations Used         504

                                    Analysis of Variance
                                           Sum of           Mean
          Source                  DF        Squares         Square    F Value    Pr > F

          Model                    9     1561.11563      173.45729     631.58    <.0001
          Error                  494      135.67310        0.27464
          Corrected Total        503     1696.78873


                      Root MSE              0.52406    R-Square     0.9200
                      Dependent Mean        9.71250    Adj R-Sq     0.9186
                      Coeff Var             5.39576

                                    Parameter Estimates

                    Parameter      Standard                           Standard
Variable    DF       Estimate         Error   t Value   Pr > |t|         Error   t Value   Pr > |t|

Intercept    1       10.87724       0.04871    223.33     <.0001       0.04993    217.84     <.0001
A3           1        0.00540       0.09092      0.06     0.9527       0.07111      0.08     0.9395
A4           1        0.39337       0.08001      4.92     <.0001       0.09066      4.34     <.0001
A5           1        0.12239       0.07031      1.74     0.0823       0.06245      1.96     0.0506
A6           1       -0.13933       0.06123     -2.28     0.0233       0.05162     -2.70     0.0072
lnCFM        1        0.91357       0.02594     35.22     <.0001       0.03581     25.51     <.0001
lnCFM2       1       -0.03587       0.00793     -4.52     <.0001       0.01237     -2.90     0.0039
lnRL         1       -0.12137       0.03446     -3.52     0.0005       0.04386     -2.77     0.0059
lnRL2        1        0.13590       0.01630      8.34     <.0001       0.03356      4.05     <.0001
lnCFMlnRL    1       -0.01011       0.01814     -0.56     0.5776       0.02163     -0.47     0.6404
                                        XTRA_SCF TT                                                  9

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          t                                           a
          s                                 a         n
          e                                 n         n                  a
```

Obs	route	segment code	ck	rstd	lev	nual_cost	ual_miles	cfm	trip miles	cost cfm	aopfreq
1	23891	B	0.00795	-1.72502	0.02611	5579.95	2484.0	7452000	27.000	0.00075	23.000
2	836A3	E	0.00798	-1.71276	0.02659	741.63	128.0	407040	4.000	0.00182	16.000
3	01590	E	0.00835	-2.13620	0.01810	6679.78	3430.4	10291200	53.600	0.00065	16.000
4	01590	D	0.00844	-2.15831	0.01792	9601.87	4931.2	14793600	53.600	0.00065	23.000
5	836A3	D	0.00906	-2.18930	0.01869	4044.14	1011.2	3215616	7.200	0.00126	23.333
6	275P3	B	0.01145	2.15169	0.02430	51221.03	4558.4	14495712	81.400	0.00353	28.000
7	800N5	B	0.01190	1.35030	0.06137	389.82	100.0	318000	100.000	0.00123	1.000
8	800N7	B	0.01190	1.35030	0.06137	389.82	100.0	318000	100.000	0.00123	1.000
9	632AH	B	0.01212	1.08797	0.09291	2487.53	500.0	1590000	500.000	0.00156	1.000
10	207FH	A	0.01372	1.58381	0.05201	1167112.06	392570.0	920133000	438.409	0.00127	30.000
11	350L9	D	0.01607	-1.24778	0.09367	15147.78	524.4	1468320	1.900	0.01032	23.000
12	144XJ	B	0.01842	3.10757	0.01904	33754.61	1139.4	3418200	41.250	0.00987	13.500
13	030TJ	A	0.01928	2.48809	0.03052	461221.03	11896.7	35690040	18.000	0.01292	313.070
14	970MH	A	0.01996	3.65144	0.01512	451876.88	15962.1	47886300	32.247	0.00944	33.000
15	841AZ	B	0.02036	-1.04185	0.15800	4.50	1.0	3180	1.000	0.00142	1.000
16	895GZ	B	0.02036	-1.04185	0.15800	4.50	1.0	3180	1.000	0.00142	1.000
17	58021	D	0.02355	4.73147	0.01085	59862.74	784.0	2493120	14.000	0.02401	28.000
18	070M2	C	0.02951	3.78181	0.02075	37185.18	720.0	2160000	24.000	0.01722	30.000
19	070M2	B	0.03049	3.84551	0.02075	38381.13	720.0	2160000	24.000	0.01777	30.000
20	632AH	C	0.03372	-1.31388	0.16362	4.55	1.0	3180	1.000	0.00143	1.000
21	940L0	D	0.03889	4.83443	0.01710	10092.25	112.0	356160	7.000	0.02834	4.000
22	030TJ	B	0.04061	4.45284	0.02082	39855.70	576.0	1728000	24.000	0.02306	24.000
23	495L1	B	0.04343	-2.19828	0.08305	6240.68	355.2	1129536	1.850	0.00552	24.000
24	850AZ	B	0.04354	-1.52523	0.15800	3.57	1.0	3180	1.000	0.00112	1.000
25	890AZ	B	0.05667	-1.74133	0.15800	3.22	1.0	3180	1.000	0.00101	1.000
26	751FE	D	0.05901	5.70249	0.01894	258996.58	1400.0	4452000	12.500	0.05818	28.000
27	606L7	B	0.08885	-1.46990	0.29187	720064.20	47995.4	152625372	3.850	0.00472	59.438
28	841DD	B	0.12429	-2.69690	0.14753	64298.84	3909.2	12431256	1.984	0.00517	26.141
29	841L0	E	0.51249	4.99696	0.17709	30002.41	24.0	76320	0.500	0.39311	6.000
30	980RH	A	0.69156	7.70124	0.11533	316449.59	314.0	360000	1.000	0.87903	30.000

XTRA_SCF TT 10

The MEANS Procedure

Variable	Median

```
fffffffffffffffffffffffffffff
annual_cost          4214.15
annual_miles         1619.00
cfm               1908580.00
atripmiles        48.9250000
fffffffffffffffffffffffffffff
```

XTRA_SCF VAN WITHOUT OUTLIERS Including Miles LE 1 11

The REG Procedure

Model: MODEL1

Dependent Variable: lnCost

Number of Observations Read 416
Number of Observations Used 416

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	8	642.33703	80.29213	639.61	<.0001
Error	407	51.09169	0.12553		
Corrected Total	415	693.42872			

Root MSE	0.35431	R-Square	0.9263
Dependent Mean	8.33513	Adj R-Sq	0.9249
Coeff Var	4.25075		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	--Heteroscedasticity Consistent- Standard Error	t Value	Pr > |t|
Intercept	1	9.05023	0.03022	299.50	<.0001	0.02918	310.14	<.0001
A3	1	0.20635	0.05896	3.50	0.0005	0.07151	2.89	0.0041
A4	1	0.46628	0.07159	6.51	<.0001	0.07091	6.58	<.0001
A6	1	0.14570	0.04058	3.59	0.0004	0.04271	3.41	0.0007
lnCFM	1	0.95310	0.01926	49.49	<.0001	0.01986	47.98	<.0001
lnCFM2	1	0.00594	0.00751	0.79	0.4296	0.00894	0.66	0.5066
lnRL	1	-0.24204	0.03627	-6.67	<.0001	0.03028	-7.99	<.0001
lnRL2	1	0.00680	0.02484	0.27	0.7845	0.02287	0.30	0.7665
lnCFMlnRL	1	-0.02085	0.01786	-1.17	0.2439	0.01667	-1.25	0.2118

XTRA_SCF VAN WITHOUT OUTLIERS 12

Obs	route	annual_ miles	annual_ cost
1	632AH	1	4.55
2	841AZ	1	4.50
3	850AZ	1	3.57

```
4     890AZ       1         3.22
5     895GZ       1         4.50
 XTRA_SCF VAN WITHOUT OUTLIERS                                   13

     The MEANS Procedure

  Variable              Median
  ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
  annual_cost         16741.95
  annual_miles         4656.00
  cfm              13458396.00
  atripmiles        76.5250000
  ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
```

XTRA_SCF TT WITHOUT OUTLIERS INCLUDING MILES LE 1 **14**

The REG Procedure
Model: MODEL1
Dependent Variable: lnCost

Number of Observations Read 496
Number of Observations Used 496

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	**8**	**1229.58931**	**153.69866**	**696.97**	**<.0001**
Error	**487**	**107.39561**	**0.22052**		
Corrected Total	**495**	**1336.98493**			

Root MSE	**0.46960**	**R-Square**	**0.9197**
Dependent Mean	**9.78647**	**Adj R-Sq**	**0.9184**
Coeff Var	**4.79847**		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	Standard Error	t Value	Pr > |t|
Intercept	1	10.91779	0.04051	269.50	<.0001	0.03470	314.61	<.0001
A4	1	0.34317	0.06956	4.93	<.0001	0.08521	4.03	<.0001
A5	1	0.09047	0.06105	1.48	0.1390	0.06249	1.45	0.1483
A6	1	-0.13141	0.05235	-2.51	0.0124	0.04739	-2.77	0.0058
lnCFM	**1**	**1.00286**	**0.02611**	**38.42**	**<.0001**	**0.01960**	**51.16**	**<.0001**
lnCFM2	1	-0.00343	0.00828	-0.41	0.6786	0.00673	-0.51	0.6103
lnRL	1	-0.19309	0.03170	-6.09	<.0001	0.02424	-7.96	<.0001
lnRL2	1	0.08563	0.01670	5.13	<.0001	0.01463	5.85	<.0001
lnCFMlnRL	1	-0.01501	0.01715	-0.87	0.3821	0.01746	-0.86	0.3905

XTRA_SCF TT WITHOUT OUTLIERS 15

Obs	contype	_TYPE_	_FREQ_	s_annual_ cost	var	VVC
1	TTR	0	504	31739207.18	1.00286	31829878.81
2	VANR	0	420	4302855.88	0.95310	4101068.69

XTRA_SCF TT WITHOUT OUTLIERS 16

Obs	_TYPE_	_FREQ_	accrued	volvar	overall_ vv
1	0	2	36042063.06	35930947.50	0.99692

X. ATTACHMENT 2

A. PR Sas Program Inter-SCF Variability

```
*PR Tests for Miles le 1;

*****************************************************************************************;
***  This Program Estimates the Cost to Capacity Variabilites                          **;
***  For Inter SCF Seasonal Transportation Designated as Christmas Contracts***;
*****************************************************************************************;

libname T19 "path" ;
options nodate ;
ods graphics off;

*******************************************************;
*Read in the Data and Determine Area Dummy  **;
*******************************************************;
data TCSS2; set t19.TCSS_FY19;

Data Tcss3; set tcss2;
annual_cost = costsegamt;
annual_miles = annmiles;
if annmiles=0 then annual_miles=".";
A1 = 0; if area = "CARIBBE" then A1=1;
A2 = 0; if area = "CENTRAL" then A2=1;
A3 = 0; if area = "EASTERN" then A3=1;
A4 = 0; if area = "NORTHER" then A4=1;
A5 = 0; if area = "SOUTHER" then A5=1;
A6 = 0; if area = "WESTERN" then A6=1;
tcfm=tripmiles*opfreq*vcube;
run;
```

```
        ********************************************;
        ***Aggregate to the Cost Segment Level   ***;
        ********************************************;
        proc sort data=tcss3; by route costsegmentcode;

        proc means noprint data=tcss3; by route costsegmentcode; id con_type
routetypedesc area account con_desc a1
        a2 a3 a4 a5 a6;
        var annual_cost annual_miles opfreq vcube tripmiles  tcfm;
        output out=costsegment_lev mean=annual_cost annual_miles aopfreq  vcube
atripmiles  acfm
                                sum=sannual_cost sannual_miles sopfreq  svcube stripmiles
cfm
                                  n=ntrips;
        run;

        data costsegment_lev (drop = _TYPE_ _FREQ_); set costsegment_lev ;
        run;

        ***********************************************;
        **Determine Truck Type                          **;
        ***********************************************;
        data costsegment_lev; set costsegment_lev;
        truck_type = "None";
        if vcube lt 1800 then truck_type = "Van" ;
        else truck_type = "TT";
        if annual_miles eq '.' then delete;
        calc_cost_cfm=annual_cost/cfm;
        run;
```

```
        ******************************************;
        ***       Define Account Categories     ***;
        ******************************************;

        DATA COSTSEGMENT_LEV; SET COSTSEGMENT_LEV;
        length account_desc $ 15;
        account_desc = "OTHER";
        if account = 53605 or account = 53607 then account_desc =
"INTRA_DISTRICT";
        if account = 53601 or account = 53603 then account_desc =  "INTRA_PDC";
        if account = 53609 or account = 53612 then account_desc =  "INTER_PDC";
        if account = 53614 or account = 53616 then account_desc =
"INTER_CLUSTER";
        if account = 53618 or account = 53621 then account_desc =  "INTER_AREA";
        if account = 53127 or account = 53129 then account_desc =  "INTRA_NDC";
        if account = 53131 or account = 53133 then account_desc =  "INTER_NDC";
        if account = 53134 or account = 53135 then account_desc = "PLANT LOAD";
        if account = 53622 then account_desc = "XINTER_AREA";
        if account = 53626 then account_desc = "XINTER_AREAHQ";
        if account = 53617 then account_desc = "XINTER_CLUSTER";
        if account = 53613 then account_desc = "XINTER_PDC";
        if account = 53624 then account_desc = "XINTER_NDC";
        if account = 53625 then account_desc = "XINTRA_AREAHQ";
        if account = 53608 then account_desc = "XINTRA_DISTRICT";
        if account = 53604 then account_desc = "XINTRA_PDC";
        if account = 53623 then account_desc = "XINTRA_NDC";
        if account = 53170 then account_desc = "DRO";
        run;
```

```
        ************************************************************************;
        *****  Estimate XMAS Inter SCF Variabilities ****************************;
        ************************************************************************;
        data XTER_SCF; set costsegment_lev;

if account_desc = "XINTER_AREA" or account_desc = "XINTER_AREAHQ" or
account_desc =    XINTER_CLUSTER" or account_desc = "XINTER_PDC";

        run;
        ****************************************************;
        *****  Estimate Variability Equation            ****;
        ****************************************************;

        data XTER_SCF_Combo; set XTER_SCF;
        proc freq; tables truck_type area;

        ************************************************************************;
        *****  Find Global Means                ****************************;
        ************************************************************************;
        proc means median;
        var annual_cost annual_miles cfm atripmiles vcube aopfreq;
        output out=gmean mean=g_annual_cost g_annual_miles g_cfm g_stripmiles
g_vcube g_aopfreq n=obs;
        run;

        proc print data = gmean; run;
```

```
*********************************************************************;
*****  Mean Center the Data            ******************************;
*********************************************************************;

data XTER_SCF_Combo_Reg;
if _n_=1 then set gmean; set XTER_SCF_Combo;

lnCost=log(annual_cost);
lnCFM=log(cfm/g_cfm);
lnRL=log(atripmiles/g_stripmiles);
lnCFM2=lnCFM*lnCFM;
lnRL2=lnRL*lnRL;
lnCFMlnRL=lnCFM*lnRL;
if truck_type="Van" then dvan=1; else dvan=0;
dvan_lncfm=dvan*lncfm;
run;

*********************************************************************;
*****  Estimate the Equation           ******************************;
*********************************************************************;
title "XMAS INTER_SCF With Miles LE 1";

Proc reg data=XTER_SCF_Combo_reg ;
model lnCost =   a3 a4 a5 a6  dvan lnCFM  lnCFM2 lnRL lnRL2 lnCFMlnRL /
white;
output out=XTER_SCF_Combo_resid rstudent=rstd h=levr cookd=ckd ;
run;

 data XTER_SCF_Combo_cooksd; set XTER_SCF_COMBO_resid;
   costcfm=annual_cost/cfm;
        if ckd > (4/obs);
                proc sort data=XTER_SCF_Combo_cooksd; by ckd;

        proc print data=XTER_SCF_Combo_cooksd;
                var route costsegmentcode ckd rstd levr annual_cost annual_miles
cfm atripmiles costcfm aopfreq;
run;

data XTER_SCF_Combo_cooksd; set XTER_SCF_Combo_cooksd;
keep route costsegmentcode ckd;

proc print data=XTER_SCF_Combo_est;
```

```
run;

*****************************************************************************************
*****;
*** Estimate Variablity Equation with Outliers Removed Including Miles LE 1
******;
*****************************************************************************************
******;
data XTER_SCF_Combo1; set XTER_SCF;

proc sort  data= XTER_SCF_Combo1; by route costsegmentcode;
proc sort  data= XTER_SCF_Combo_cooksd; by route costsegmentcode;

data XTER_SCF_Combo2; merge  XTER_SCF_Combo1
XTER_SCF_Combo_cooksd; by route costsegmentcode;

data XTER_SCF_Combo2;  set XTER_SCF_Combo2;
if ckd ge .10 then delete;
run;

data test; set XTER_SCF_Combo2; *Testing for Miles LE 1;
where annual_miles le 1;
proc print;
var route annual_miles annual_cost ;
run;

data XTER_SCF_Combo2;  set XTER_SCF_Combo2; *Deleting Obs where
Miles LE 1;
if annual_miles le 1 then delete;
run;

data XTER_SCF_Combo2; set XTER_SCF_Combo2;
proc means median;
var annual_cost annual_miles cfm atripmiles;
output out=gmean mean=g_annual_cost g_annual_miles g_cfm g_stripmiles;
run;

data XTER_SCF_COMBO2_Reg;
if _n_=1 then set gmean; set XTER_SCF_COMBO2;

lnCost=log(annual_cost);
lnCFM=log(cfm/g_cfm);
```

```
lnRL=log(atripmiles/g_stripmiles);
lnCFM2=lnCFM*lnCFM;
lnRL2=lnRL*lnRL;
lnCFMlnRL=lnCFM*lnRL;
if truck_type="Van" then dvan=1; else dvan=0;
dvan_lncfm=dvan*lncfm;

title "XMAS INTER_SCF WITHOUT OUTLIERS No Mi le 1";


Proc reg data=XTER_SCF_COMBO2_reg  ;
model lnCost =a4 a5 dvan  lnCFM lnCFM2 lnRL lnRL2 lnCFMlnRL / white;

run;
quit;
```

B. PR Output For Inter-SCF Variability

```
                                 Xmas interscf no le 1
                      The SAS System                                    1

                          The FREQ Procedure

           truck_                             Cumulative    Cumulative
           type      Frequency     Percent     Frequency      Percent
           ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
           TT             539       98.90           539        98.90
           Van              6        1.10           545       100.00


                                               Cumulative    Cumulative
           area        Frequency     Percent     Frequency      Percent
           ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
           CENTRAL         140       25.69           140        25.69
           EASTERN         132       24.22           272        49.91
           NORTHER          93       17.06           365        66.97
           SOUTHER         158       28.99           523        95.96
           WESTERN          22        4.04           545       100.00
                               The SAS System                                    2

                            The MEANS Procedure

                         Variable              Median
                         ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
                         annual_cost        102455.48
                         annual_miles        29475.00
                         cfm              93085914.00
                         atripmiles       500.0000000
                         vcube                3180.00
                         aopfreq           25.0000000
                         ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
                                The SAS System                                    3

                   g_annual_  g_annual_
 Obs  _TYPE_  _FREQ_     cost      miles        g_cfm     g_stripmiles  g_vcube  g_aopfreq  obs

  1      0      545   229023.32   75135.54  236193543.15     616.778    3147.64   22.4647   545

                                XMAS INTER_SCF                                    4
                              The REG Procedure
                                Model: MODEL1
                         Dependent Variable: lnCost
                   Number of Observations Read         545
                   Number of Observations Used         545
```

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	10	2575.96090	257.59609	892.17	<.0001
Error	534	154.18104	0.28873		
Corrected Total	544	2730.14194			

Root MSE	0.53733	R-Square	0.9435
Dependent Mean	11.13099	Adj R-Sq	0.9425
Coeff Var	4.82738		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	--Heteroscedasticity Consistent- Standard Error	t Value	Pr > |t|
Intercept	1	12.33069	0.04817	256.00	<.0001	0.03536	348.67	<.0001
A3	1	0.07571	0.06583	1.15	0.2506	0.06810	1.11	0.2667
A4	1	0.01174	0.07448	0.16	0.8748	0.07765	0.15	0.8799
A5	1	-0.07154	0.06277	-1.14	0.2549	0.03617	-1.98	0.0485
A6	1	0.22532	0.12784	1.76	0.0786	0.14094	1.60	0.1105
dvan	1	0.46452	0.23010	2.02	0.0440	0.16628	2.79	0.0054
lnCFM	1	0.92097	0.02743	33.57	<.0001	0.03182	28.94	<.0001
lnCFM2	1	-0.01579	0.00672	-2.35	0.0191	0.00815	-1.94	0.0531
lnRL	1	-0.04715	0.04360	-1.08	0.2799	0.04270	-1.10	0.2700
lnRL2	1	0.09095	0.01522	5.98	<.0001	0.01892	4.81	<.0001
lnCFMlnRL	1	-0.03528	0.01421	-2.48	0.0133	0.01695	-2.08	0.0378

XMAS INTER_SCF 5

costsegmen	annual	annual_	atrip	co	ao

Obs	route	tcode	ck	rstd	lever	cost	miles	cfm	miles	stcfm	pfreq
1	926L2	D	0.00811	-1.2562	0.05355	23328.99	5979.6	19015128.00	38.975	0.00123	18.500
2	926L2	C	0.00934	1.2811	0.05898	9605.12	728.2	2315676.00	26.033	0.00415	4.333
3	460AZ	C	0.01105	-1.0862	0.09345	2.68	1.0	3180.00	1.000	0.00084	1.000
4	773GH	B	0.01886	2.6632	0.02873	5640.92	500.0	1590000.00	500.000	0.00355	1.000
5	330EH	A	0.01948	-1.4481	0.09289	2.05	1.0	3180.00	1.000	0.00064	1.000
6	630LH	A	0.02341	1.1060	0.17397	1473.64	500.0	630000.00	125.000	0.00234	1.000
7	070EH	C	0.02511	3.5886	0.02145	9758.08	500.0	1590000.00	250.000	0.00614	1.000
8	77579	B	0.02989	-1.2461	0.17488	2190.17	1744.5	2198070.00	58.150	0.00100	15.000
9	328SE	H	0.04771	-1.1471	0.28523	20753.99	717.0	2280060.00	1.200	0.00910	19.800
10	95010	A	0.07186	-2.2009	0.14115	654920.86	239973.5	763114340.34	43.831	0.00086	343.682
11	900CH	B	0.10298	4.1339	0.06392	20995.15	312.0	992160.00	13.000	0.02116	12.000
12	207AE	C	0.33311	7.2223	0.07148	111370.58	214.6	682428.00	3.700	0.16320	29.000
13	144EZ	B	1.35258	-14.0513	0.09345	0.01	1.0	3180.00	1.000	0.00000	1.000
14	450VZ	C	1.55362	15.4153	0.09403	3527.78	1.0	3180.00	1.000	1.10936	1.000

```
                XMAS INTER_SCF                                          6

                        annual_    annual_
     Obs    route      miles       cost

      1     070EH        1         3.67
      2     117AH        1         5.21
      3     290AH        1         3.58
      4     330EH        1         2.05
      5     460AZ        1         2.68
      6     480AZ        1         3.74
      7     500AH        1         3.32
      8     500AZ        1         4.44
      9     773GH        1         3.85
                XMAS INTER_SCF                                          7

             The MEANS Procedure

        Variable              Median
        ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
        annual_cost        104056.47
        annual_miles        31288.60
        cfm              99295500.00
        atripmiles       513.9250000
        ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
XMAS INTER_SCF WITHOUT OUTLIERS No Mi le 1                              8
             The REG Procedure
                Model: MODEL1
        Dependent Variable: lnCost
Number of Observations Read         532
 Number of Observations Used         532
```

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	8	1519.67277	189.95910	1916.31	<.0001
Error	523	51.84371	0.09913		
Corrected Total	531	1571.51648			

Root MSE	0.31485	R-Square	0.9670
Dependent Mean	11.33452	Adj R-Sq	0.9665
Coeff Var	2.77776		

Parameter Estimates

						--Heteroscedasticity Consistent-		
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	Standard Error	t Value	Pr > |t|
Intercept	1	12.36739	0.02071	597.09	<.0001	0.01802	686.15	<.0001
A4	1	0.08950	0.03941	2.27	0.0235	0.04409	2.03	0.0429
A5	1	-0.08684	0.03173	-2.74	0.0064	0.03175	-2.73	0.0065
dvan	1	0.31105	0.14337	2.17	0.0305	0.15714	1.98	0.0483
lnCFM	**1**	**0.96277**	**0.01669**	**57.70**	**<.0001**	**0.01715**	**56.14**	**<.0001**
lnCFM2	1	-0.00488	0.00404	-1.21	0.2278	0.00457	-1.07	0.2866
lnRL	1	-0.04506	0.02726	-1.65	0.0989	0.03307	-1.36	0.1735
lnRL2	1	0.07268	0.00898	8.10	<.0001	0.00962	7.55	<.0001
lnCFMlnRL	1	-0.01937	0.01120	-1.73	0.0843	0.01578	-1.23	0.2202